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U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE


# PETITION FEE
## under 37 CFR 1.17(f), (g) & (h)
## TRANSMITTAL

(Fees are subject to annual revision)

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**P.O. Box 1450, Alexandria, VA 22313-1450**

| | |
|---|---|
| **Application Number** | 10/816,217 |
| **Filing Date** | April 1, 2004 |
| **First Named Inventor** | Nicholas Millington |
| **Art Unit** | 2185 |
| **Examiner Name** | Unknown |
| **Attorney Docket Number** | PA3445US |

**Enclosed is a petition filed under 37 CFR** 1.102(d) **that requires a processing fee (37 CFR 1.17(f), (g), or (h)). Payment of $** 130.00 **is enclosed.**

This form should be included with the above-mentioned petition and faxed or mailed to the Office using the appropriate Mail Stop (e.g., Mail Stop Petition), if applicable. *For transmittal of processing fees under 37 CFR 1.17(i), see form PTO/SB/17i.*

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**Petition Fees under 37 CFR 1.17(f): Fee $400 Fee Code 1462**
For petitions filed under:
**§ 1.36(a)** - for revocation of a power of attorney by fewer than all applicants
**§ 1.53(e)** - to accord a filing date.
**§ 1.57(a)** - to accord a filing date.
**§ 1.182** - for decision on a question not specifically provided for.
**§ 1.183** - to suspend the rules.
**§ 1.378(e)** - for reconsideration of decision on petition refusing to accept delayed payment of maintenance fee in an expired patent.
**§ 1.741(b)** - to accord a filing date to an application under § 1.740 for extension of a patent term.

**Petition Fees under 37 CFR 1.17(g): Fee $200 Fee Code 1463**
For petitions filed under:
**§ 1.12** - for access to an assignment record.
**§ 1.14** - for access to an application.
**§ 1.47** - for filing by other than all the inventors or a person not the inventor.
**§ 1.59** - for expungement of information.
**§ 1.103(a)** - to suspend action in an application.
**§ 1.136(b)** - for review of a request for extension of time when the provisions of section 1.136(a) are not available.
**§ 1.295** - for review of refusal to publish a statutory invention registration.
**§ 1.296** - to withdraw a request for publication of a statutory invention registration filed on or after the date the notice of intent to publish issued.
**§ 1.377** - for review of decision refusing to accept and record payment of a maintenance fee filed prior to expiration of a patent.
**§ 1.550(c)** - for patent owner requests for extension of time in ex parte reexamination proceedings.
**§ 1.956** - for patent owner requests for extension of time in inter partes reexamination proceedings.
**§ 5.12** - for expedited handling of a foreign filing license.
**§ 5.15** - for changing the scope of a license.
**§ 5.25** - for retroactive license.

**Petition Fees under 37 CFR 1.17(h): Fee $130 Fee Code 1464**
For petitions filed under:
**§ 1.19(g)** - to request documents in a form other than that provided in this part.
**§ 1.84** - for accepting color drawings or photographs.
**§ 1.91** - for entry of a model or exhibit.
**§ 1.102(d)** - to make an application special.
**§ 1.138(c)** - to expressly abandon an application to avoid publication.
**§ 1.313** - to withdraw an application from issue.
**§ 1.314** - to defer issuance of a patent.

K. Brian Bathurst — Signature
August 24, 2006 — Date
K. Brian Bathurst — Typed or printed name
51,442 — Registration No., if applicable

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICANTS: Nicholas Millington

SERIAL NO.: 10/816,217

FILING DATE: April 1, 2004

TITLE: System and Method for Synchronizing Operations Among a Plurality of Independently Clocked Digital Data Processing Devices

EXAMINER: Unknown

ATTY. DKT. NO.: PA3445US

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CERTIFICATE OF MAILING

I hereby certify that this correspondence is being deposited with the United States Postal Service as Express Mail in an envelope addressed to: Mail Stop Petition, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on **August 24, 2006**.

Signed: K. Brian Bathurst
K. Brian Bathurst

Mail Stop Petition
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

PETITION TO MAKE SPECIAL
37 C.F.R. 1.102 and MPEP § 708.02(VIII)

08/30/2006 GWORDOF1 00000029 10816217
01 FC:1464 130.00 OP

**1. Petition -- MPEP § 708.02(VIII)(A):**

Applicants hereby petition to make this new application special. This application has not received any examination by the Examiner.

**2. Fee**

A check for the petition amount has been included. The Office is authorized to charge any additional fees for this petition to Deposit Account No. 06-0600.

**3. Claims -- MPEP § 708.02(VIII)(B)**

All of the claims in this case are directed to a single invention. If the Office determines that all of the claims presented are not directed to a single invention, then Applicants will make an election without traverse as a prerequisite to the grant of special status.

**4. Searches and Declaration – MPEP § 708.02(VIII)(C)**

As the undersigned practitioner, being duly registered to practice before the U.S. Patent and Trademark Office, I declare that a careful and thorough pre-examination search of the prior art has been made.

The searches were carried out by technical experts using commercially available databases of patents and publications, and were supplemented with materials provided by the client. Primary Examiners Andrew T. Caldwell (Art Unit 2142), Chieh M. Fan (Art Unit 2611), and Paul B. Yanchus (Art Unit 2611), were consulted regarding an appropriate field of search.

The classes and subclasses searched include:

CLASS 326 ELECTRONIC DIGITAL LOGIC CIRCUITRY
Subclass 93

CLASS 370 MULTIPLEX COMMUNICATIONS

Subclass 503

CLASS 375 PULSE OR DIGITAL COMMUNICATIONS

Subclasses 354, 356, and 358

CLASS 386 TELEVISION SIGNAL PROCESSING FOR DYNAMIC RECORDING OR REPRODUCING

Subclass 46

CLASS 709 ELECTRICAL COMPUTERS AND DIGITAL PROCESSING SYSTEMS: MULTICOMPUTER DATA TRANSFERRING

Subclasses 201, 204, 208, 209, 210, 211, 237, and 248

CLASS 725 INTERACTIVE VIDEO DISTRIBUTION SYSTEMS

Subclass 146

The PTO's EAST and WEST were also used in performing the search. A search was also performed for non-patent literature on the Internet. Because the present application claims the benefit and priority of Provisional Patent Application Serial No. 60/490,768 filed on July 28, 2003, references filed subsequent to July 28, 2003 were excluded from the search results discussed herein.

**5. Discussion of Related References --MPEP § 708.02(VIII)(D) and (E)**

The references deemed most closely related to the subject matter of the claimed invention are discussed below. Copies of any non-U.S. references, non-patent references, and a form PTO/SB/08A will be submitted concurrently with an Information Disclosure Statement.

**(1) U.S. Patent 5,875,354 Charlton et al., "System for Synchronization by Modifying the Rate of Conversion by Difference of Rate Between First Clock and Audio Clock During a Second Time Period" (hereinafter "Charlton")**

Charlton discloses a method and apparatus for synchronizing the presentation of a stream of time dependent data to a first clock having a first frequency. First, a rate conversion is performed on the data stream for a first time period. Second, the rate of conversion is modified to

generate a modified rate of conversion. Third, a rate conversion having the modified rate of conversion is performed on the data stream for a second period of time. The second and third steps are repeated until all samples in the data stream are presented. The rate of conversion is modified based on a measurement of the difference between a rate of the first clock and a rate of a second less precise clock and latency errors introduced by previous inaccuracies in a second clock rate. (Column 5, Lines 15-27).

In one embodiment, the first clock is a real time clock of a computer system, typically provided by an oscillator chip located on the motherboard/baseboard. The second clock is an audio clock, which is part of an audio subsystem, which may be implemented as an add-in card to a computer system. Charlton synchronizes a data stream, having a plurality of samples (e.g., audio and video information) by performing a rate conversion on the data stream. Charlton modifies the rate of conversion applied to the data stream based on the measurement of a difference between the rate for the real time clock and the rate of the presentation clock. (Column 5, Lines 28-39).

In an alternative embodiment, Charlton includes a first logic circuit for receiving the data stream and for performing rate conversion on the data stream having a plurality of samples. A second logic circuit includes an input for receiving a first frequency (e.g., the frequency of a real time clock of the computer system). The second logic circuit is coupled to the first logic circuit and the data buffer. The second logic circuit receives a value from the data buffer that is an estimate of the number of samples presented (e.g., audio played back through a sampler digital-to-analog converter (DAC)). Based upon this value, the second logic circuit generates a modified rate of conversion that synchronizes the data values in the data stream to the real time clock. The data buffer is coupled to a digital to analog converter that converts the digital data values into

analog values and presents these values to the user via a transducer (e.g., speaker) at an independent second clock rate (e.g., the audio clock frequency). (Column 5, Lines 40-57).

In contrast, Applicant teaches a system comprising a plurality of devices, one of the devices operating as a task source device and at least one other device operating as a member of a synchrony group. The task source device is configured to distribute a series of tasks to the synchrony group, each task being associated with a time stamp indicating a time, relative to a clock maintained by the task source device, at which the devices comprising the synchrony group are to execute the respective task. Charlton fails to teach or suggest distribut[ing] a series of tasks to the synchrony group, each task being associated with a time stamp indicating a time, relative to a clock maintained by the task source device, at which the devices comprising the synchrony group are to execute the respective task.

**(2) U.S. Patent Application Publication Number 2004/0252400 Blank et al., "Computer Media Synchronization Player" (hereinafter "Blank")**

Blank discloses an architecture and methodology for improved synchronization and display of video and/or audio-visual media. In one aspect, a media synch player includes a time control module, a digital data storage and retrieval device coupled to and responsive to the time control module and an audiovisual data signal output configured to supply audiovisual data to a display by playing a media file from the digital data storage and retrieval device in response to commands from a system controller. The time control module is configured to request a system time from an external time server, reset the time control module in accordance with the system time, lock to a master clock contained in the external time server and resynchronize the first time control module in response to predetermined criteria being met. (Paragraph 0010).

In contrast, Applicant teaches a system comprising a plurality of devices, one of the devices operating as a task source device and at least one other device operating as a member of a synchrony group. The task source device is configured to distribute a series of tasks to the synchrony group, each task being associated with a time stamp indicating a time, relative to a clock maintained by the task source device, at which the devices comprising the synchrony group are to execute the respective task. Blank fails to teach or suggest each task being associated with a time stamp indicating a time, relative to a clock maintained by the task source device.

**(3) U.S. Patent Application Publication Number 2002/0034374 Barton, "Method and Apparatus Implementing Random Access and Time-Based Functions on a Continuous Stream of Formatted Digital Data" (hereinafter "Barton")**

Barton discloses a facility that provides for the manipulation of a continuous stream of digital information as if it supported random access and variable rate presentation on demand by the consumer of the stream. The possible operations on the data stream are limited only by the storage capacity and 10 bandwidth of the system which implements the apparatus and methods, whether that storage be volatile, such as DRAM, or non-volatile, such as hard disk storage, or a combination of both. The apparatus and methods support operations, sometimes referred to as virtual VCR functions, such as pause, rewind, fast forward, and play, as well as more sophisticated and unique operations, such as play faster, play slower, and play in reverse. Additionally, the apparatus and methods in Barton provide a mechanism whereby such operations are instantaneous from the point of view of the consumer of the data stream, unlike in mechanical systems. The apparatus and methods also support the ability to capture portions of

the data stream which are temporarily held by the apparatus, such that this captured data can be stored or sent over a network in formats suitable for presenting the data to other consumers, or for editing and manipulation by other tools or methods. (Paragraph 0019).

Barton also discloses a method and apparatus for providing pass through or capture of continuous linear streams of digital information represented in various formats while providing the appearance of a locally stored stream. The preferred embodiment of the invention comprises at least one media cache for copying blocks of data from the information stream. Data in the media cache can be viewed as a snapshot of the continuous stream of digital information. Barton also comprises a playback pointer. The playback pointer position selects a portion of the media cache that is to be accessed to provide functions including any of pause, rewind, fast forward, play, play faster, play slower, and play in reverse. (Paragraph 0020).

In contrast, Applicant teaches a system comprising a plurality of devices, one of the devices operating as a task source device and at least one other device operating as a member of a synchrony group. The task source device is configured to distribute a series of tasks to the synchrony group, each task being associated with a time stamp indicating a time, relative to a clock maintained by the task source device, at which the devices comprising the synchrony group are to execute the respective task. Barton fails to teach or suggest distributing a series of tasks to the synchrony group, each task being associated with a time stamp indicating a time, relative to a clock maintained by the task source device, at which the devices comprising the synchrony group are to execute the respective task.

(4) **U.S. Patent Application Publication Number 2002/0073228 Cognet et al., "Method for Creating Accurate Time-Stamped Frames Sent Between Computers via a Network" (hereinafter "Cognet")**

Cognet discloses a method for creating accurate time-stamped frames sent between computers connected via a network, such as the Internet. The method generally comprises the steps of first generating a time reference signal, and synchronizing clocks associated with sending and receiving computers with the time reference signal. A test frame is created that includes a tag having reserved fields for transmit and receive time stamps. A transmit time stamp is inserted into the reserved transmit time stamp field, corresponding to the time on the synchronized clock of the sending computer at the instant the test frame is sent on to the network. The test frame having the transmit time stamp is received by the receiving computer and a receive time stamp is inserted into the reserved received time stamp field, corresponding to the time on the synchronized clock of the receiving computer when the test frame was received by the receiving computer. (Paragraph 0021).

In a preferred embodiment, Cognet teaches a global positioning system receiver in communication with either the sending or receiving computer receives a universal coordinated time signal in order to generate the reference signal. Typically, the clock and global positioning system receivers are electronically connected on a device, such as a card interfacing with a multi-master bus of the receiving or sending computer. The clocks are initialized with the received universal coordinated time signal, and over time the universal coordinated time signal is tracked and averaged periodically and the clock adjusted to correspond the universal coordinated time signal. The clock is adjusted by altering the voltage applied to a voltage controlled crystal oscillator associated with the clock to maintain synchronization with the universal time signal.

Due to the fact that the clock operates independent of the operating system clock within the sending or receiving computer, the synchronized clocks have a resolution of between 10 and 100 nanoseconds. (Paragraph 0022).

The original test frame and tag are created by software residing in the sending computer. The tag originally includes complimentary time information in the reserved transmit and received time stamp fields which enables the insertion of the synchronized transmit and receive time stamps upon transmit and receipt, respectively, and also allows transport protocol checksum neutrality otherwise referred to as transparency. As the test frame is being sent on to the network, the transmit time stamp replaces the complimentary transmit time information in the transmit time stamp fields automatically for each test frame without intervention of the sending computer's central processing unit. This avoids the delays commonly encountered in previous methods, and provides nearly instantaneous time stamping as the test frame is sent on to the network wire. (Paragraph 0023).

Cognet teaches two methods of attaching a received time stamp corresponding to the synchronized time that the test frame was received by the receiving computer. In the first method, the pertinent components of Cognet snoop and look for the start of receive frame buffer addresses on the multi-master bus. The receiving computer automatically attaches a received time stamp corresponding to the synchronized time that the frame was received for not only the test frames, but each frame received by the receiving computer. In the other method, the receiving computer detects the tag of each test frame and attaches a received time stamp corresponding to the synchronized time that the frame was received to only the test frames. In either case, the receiving computer may temporarily store the received time stamps in a register of first in first out (FIFO), and write them onto the reserved area of the corresponding head of the

receive frame buffer. This allows the nearly exact time, according to the internal error of the synchronized clock, that the test frames were received to be associated with the appropriate test frame, even if this is performed after receipt. (Paragraph 0024).

In contrast, Applicant teaches a system comprising a plurality of devices, one of the devices operating as a task source device and at least one other device operating as a member of a synchrony group. The task source device is configured to distribute a series of tasks to the synchrony group, each task being associated with a time stamp indicating a time, relative to a clock maintained by the task source device, at which the devices comprising the synchrony group are to execute the respective task. Cognet fails to teach or suggest a task source device configured to distribute a series of tasks to the synchrony group, each task being associated with a time stamp indicating a time, relative to a clock maintained by the task source device, at which the devices comprising the synchrony group are to execute the respective task.

**(5) U.S. Patent 7,007,106 Flood et al., "Protocol and Method for Multi-Chassis Configurable Time Synchronization" (hereinafter "Flood")**

Flood provides systems and methods for time synchronization of operations in a control system. Synchronization networks and devices are provided for transferring synchronization information between controllers in a distributed or localized control system, which is employed in order to allow operations of one or more such controllers to be synchronized with respect to time. Flood also discloses synchronization protocols and hardware apparatus employed in synchronizing control operations in a control system.

Flood provides for temporal synchronization of events and operations across multiple synchronization time zones, for example, whereby control events can be coordinated according

to a master synchronization time value. In addition, Flood provides for time synchronization within localized synchronization time zones, and across multiple time zones. Synchronization components can be configured in a variety of topologies, such as star, daisy-chain, and loop configurations, as well as combinations thereof. The synchronization components, moreover, can be configured as master or slave, wherein slaves within a time zone receive synchronization information from a local master, and wherein a system master provides synchronization information to local masters in other time zones. Flood thus provides system wide synchronization, wherein time related control operations, such as time stamping inputs, scheduling outputs, and scheduling periodic or one-shot type events can be achieved in any controller in the system.

According to one aspect of Flood, a time synchronization system is provided for an industrial control system, which comprises a synchronization network for transferring synchronization information between two or more controllers and two or more synchronization components operatively associated with the controllers. The synchronization components, which can comprise interfaces on stand-alone controllers, or synchronization modules within a control chassis or rack, interface with the synchronization network for transferring the synchronization information. The synchronization components exchange synchronization information with each other and provide the synchronization information to the associated controllers, which employ the synchronization information in order to operate in temporal synchronization.

Another aspect of Flood provides methods for synchronizing controllers in a control system. The methodologies comprise providing a communications channel for transferring synchronization information between first and second controllers in the control system, transferring synchronization information between the first and second controllers via the

communications channel, and operating the first and second controllers in temporal synchronization using the synchronization information.

In accordance with yet another aspect of Flood, a protocol is provided for transferring synchronization information from a first synchronization component to a second synchronization component via a synchronization network. The protocol comprises sending a message frame from the first synchronization component to the second synchronization component, where the message frame has synchronization information and/or data. Another aspect of Flood provides a method of transferring synchronization information from a first synchronization component to a second synchronization component, which comprises receiving a message frame from the first synchronization component, presenting direct data from the frame to a processor associated with the second synchronization component, buffering multiplexed data from the frame if all portions of the multiplexed data have not been received, and presenting the multiplexed data from a buffer and from the current message frame if all portions of the multiplexed data have been received.

Another aspect of Flood provides a time synchronization apparatus for synchronizing operation of a first controller with that of a second controller in a control system. The apparatus can be employed in stand-alone controllers, and/or in a module in a control chassis, and can comprise a processor interface for interfacing with a host processor, a transmitter adapted to transmit synchronization information and data to a network in the control system, a receiver adapted to receive synchronization information and data from the network, and a timing system with a clock maintaining an indication of time according to information received from one of the network and the host processor. Another aspect of Flood provides a synchronization system for synchronizing operation of a first controller with that of a second controller in a control system.

In contrast, Applicant teaches a system comprising a plurality of independently clocked devices, one of the devices operating as a task source device and at least one other device operating as a member of a synchrony group. The task source device is configured to distribute a series of tasks to the synchrony group, each task being associated with a time stamp indicating a time, relative to a clock maintained by the task source device, at which the independently clocked devices comprising the synchrony group are to execute the respective task. Flood fails to teach or suggest a task source device [] configured to distribute a series of tasks to the synchrony group, each task being associated with a time stamp indicating a time, relative to a clock maintained by the task source device, at which the independently clocked devices comprising the synchrony group are to execute the respective task.

**(6) Other Prior Art**

The following prior art was reviewed and determined to be less relevant and/or cumulative with respect to the above prior art.

| Patent/Pub. No. | Issue/Pub. Date | Patentee | Class | Sub-class | Filing Date |
|---|---|---|---|---|---|
| 6,157,957 | Dec. 5, 2000 | Berthaud | 709 | 248 | Aug. 13, 1998 |
| 6,175,872 | Jan. 16, 2001 | Neumann et al. | 709 | 231 | Dec. 12, 1997 |
| 6,332,147 | Dec. 18, 2001 | Moran et al. | 707 | 500.1 | Nov. 3, 1995 |
| 6,898,642 | May 24, 2005 | Chafle et al. | 709 | 248 | Apr. 17, 2001 |
| 2002/0002562 | Jan. 3, 2002 | Moran et al. | 707 | 500 | Nov. 3, 1995 |

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|---|---|---|---|---|---|
| 2002/0143998 | Oct. 3, 2002 | Rajagopal et al. | 709 | 248 | Mar. 30, 2001 |
| 2003/0035444 | Feb. 20, 2003 | Zwack | 370 | 503 | Aug. 9, 2002 |
| 2003/0066094 | Apr. 3, 2003 | Van der Schaar et al. | 725 | 151 | Sep. 29, 2001 |
| 2004/0249982 | Dec. 9, 2004 | Arnold et al. | 709 | 248 | Sep. 13, 2002 |
| 2005/0058149 | Mar. 17, 2005 | Howe | 370 | 428 | Sep. 22, 2004 |
| 2005/0081213 | Apr. 14, 2005 | Suzuoki et al. | 718 | 107 | Oct. 18, 2004 |
| 5,867,691 | Feb. 2, 1999 | Shiraishi | 395 | 551 | Mar. 15, 1993 |
| 6,912,610 | Jun. 28, 2005 | Spencer | 710 | 240 | Mar. 28, 2003 |
| 6,920,373 | Jul. 19, 2005 | Xi et al. | 700 | 245 | Apr. 15, 2002 |
| 2002/0163361 | Nov. 7, 2002 | Parkin | 326 | 93 | May 7, 2001 |
| 2002/0165921 | Nov. 7, 2002 | Sapieyevski | 709 | 204 | Apr. 24, 2002 |
| 2003/0041173 | Feb. 27, 2003 | Hoyle | 709 | 248 | Aug. 10, 2001 |
| 2004/0024925 | Feb. 5, 2004 | Cypher et al. | 710 | 1 | Jun. 30, 2003 |
| 2004/0027166 | Feb. 12, 2004 | Mangum et al. | 326 | 93 | Aug. 8, 2002 |
| 2005/0010691 | Jan. 13, 2005 | Oyadomari et al. | 709 | 248 | Jun. 30, 2004 |

| | | | | | |
|---|---|---|---|---|---|
| EP1111527B1 | Jun. 27, 2001 | Kizu et al. | 17 | 30 | Nov. 19, 1999 |
| EP0672985A1 | Sep. 20, 1995 | Kern et al. | 11 | 14 | Feb. 22, 1994 |
| EP0251584A2 | Jan. 7, 1988 | Goyer et al. | 9 | 46 | Jun. 26, 1986 |

Non-Patent Literature

| Title | Author | Source | Date |
|---|---|---|---|
| "The MPEG-2 Transport Stream" | | http://www.coolstf.com/mpeg/#ts | |
| "Network Time Protocol (version 3) Specification, Implementation and Analysis" | | http://toi.iriti.cnr.it/rfc/rfc1305.txt | |
| "An Adaptive Stream Synchronization Protocol" | | Google.com | |
| "Group Synchronization in MultiCast Media Communications" | | Dogpile.com | |
| "Intra-and Inter-Stream Synchronization for Stored Multimedia Streams" | | Info.com | |

## 6. Conclusion

Applicants believe that this Petition to Make Special has met all requirements set forth by 37 C.F.R. 1.102 and MPEP § 708. 02(VIII), and respectfully requests that this Petition to Make Special be granted.

Respectfully submitted,
Nicholas Millington

Date: 8-24-2006 By: K. Brian Bathurst

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